INDUSTRY CIRCULAR

DEPARTMENT OF THE TREASURY
Bureau of Alcohol, Tobacco and Firearms
Washington, D.C. 20224

Number: 72-34 Date: October 26, 1972

Carbon Dioxide Test Procedures

Proprietors of bonded wine cellars,
taxpaid wine bottling houses,
and others concerned:

Purpose

The purpose of this circular is to announce the addition of the enzymatic method to the authorized test procedures for determining the amount of carbon dioxide added to or retained in still wines under the provisions of 26 CFR 240.531 and 240.534. This method will be published as an ATF Procedure in an early issue of the Alcohol, Tobacco and Firearms Bulletin.

Background

Public Law 85-859 amended 26 U.S.C. 5041(a) to provide that a limited quantity of carbon dioxide may be added to or retained in still wines. 26 CFR 240.534 provides that the Director, Bureau of Alcohol, Tobacco and Firearms, may prescribe procedures for determining the carbon dioxide content of still wines. Revenue Procedure 59-33 authorized two procedures, the manometric method and the volumetric method (referred to by industry circular 59-47 as the "Gasometric Procedure" and "Titrimetric Procedure").

Procedures Authorized

The enzymatic method is hereby authorized by the Director as an acceptable test procedure for the determination of the quantity of carbon dioxide added to or retained in still wines. This method is described in detail below. Any of these three procedures, the enzymatic method, the manometric method or the volumetric method, may be used to determine the carbon dioxide content of still wines.

The Enzymatic Method

Preparation of reagent:

Carbonic anhydrase solution. - Prepare aqueous solution containing approximately 1 milligram enzyme/milliliter. This solution is stable approximately 2 weeks in refrigerator.

Determination of Carbon Dioxide:

Cool sample to 0°C or less, so that it can be pipetted without loss of CO_2. Gently mix by inverting bottle several times. With automatic 25 or 30 milliliter pipet with Teflon stopcock, dispense aliquot of 0.1N NaOH into beaker. Rinse 20 milliliter pipet with sample to prevent warming sample with possible loss of CO_2. Pipet sample with tip submerged just below surface of NaOH in beaker. Add 3-4 drops enzyme, and place beaker under glass and calomel electrodes. (Beckman 41263 and 40463 are satisfactory.) Titrate to pH 8.45 with 0.1N H_2SO_4 from 5 milliliter buret graduated in 0.01 milliliter.

To correct for presence of acids other than H_2CO_3, place 50 milliliters wine in 500 milliliter heavy-walled flask at room temperature and agitate 1 minute under vacuum of approximately 27". Titrate 20 milliliters to pH 7.75 with 0.1N NaOH as above. Subtract milliliters used from that used in first titration. Calculate as follows: [(Net milliliters NaOH x normality) - (milliliters H_2SO_4 x normality)] x 100 x 44/milliliters sample = milligrams CO_2/100 milliliters wine.

This procedure and the previously authorized procedures, except for minor editorial changes, are the same as those appearing on pages 189-191 of the Eleventh Edition of the Official Methods of Analysis published by the Association of Official Anylitical Chemists, Washington, D. C.

Inquiries

Inquiries regarding this circular should refer to its number and be addressed to your Regional Director, Bureau of Alcohol, Tobacco and Firearms.

Rex D. Davis

Rex D. Davis
Director